AMENDMENTS TO THE CLAIMS

Please substitute the following claims for the pending claims with the same numbers respectively:

Claim 1 (Currently amended): A process for producing a phosphorus heterocyclic dimer according to formula (5) comprising the steps of:

reacting, in the presence of a [[base]] n-butyl lithium, primary phosphine represented by formula (1):

~~[Chem. 1]~~

$$R\text{-}PH_2 \qquad (1)$$

(wherein R represents a linear [[,]] or a branched~~, or cyclic~~ alkyl group having 2 to 20 carbon atoms or a cyclic alkyl group having 3 to 20 carbon atoms) with a compound represented by formula (2):

~~[Chem. 2]~~

$$Y\text{-}C_nH_{2n}\text{-}Y \qquad (2)$$

(wherein Y represents a halogen atom or a leaving group selected from -OTs, -OTf, and -OMs, and n represents a number of 3 to 6);

reacting [[the]] a product , which was obtained by said step of reacting primary phosphine represented by formula (1) with a compound represented by formula (2), with boron trihydride, oxygen, or sulfur to obtain a phosphorus heterocyclic compound represented by formula (3):

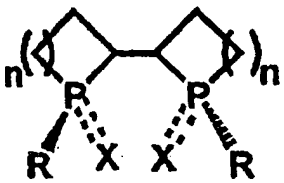
~~[Chem. 3]~~

(3)

(wherein R represents ~~the same as the above~~ a linear or a branched alkyl group having 2 to 20 carbon atoms or a cyclic alkyl group having 3 to 20 carbon atoms, n ~~represents a number of~~ equals 1 ~~to 4~~, X represents a boron trihydride group, an oxygen atom, or a sulfur atom, and === represents a single bond when X is a boron trihydride group or a double bond when X is an oxygen atom or sulfur atom);

dimerizing the ~~resultant compound~~ phosphorus heterocyclic compound represented by formula (3) to produce a phosphorus heterocyclic dimer represented by formula (4):

~~[Chem. 4]~~

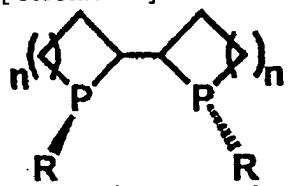


(4)

(wherein R ~~, n, and X represent the same as the above~~ represents a linear or a branched alkyl group having 2 to 20 carbon atoms or a cyclic alkyl group having 3 to 20 carbon atoms, n equals 1, X represents a boron trihydride group, an oxygen atom, or a sulfur atom); and [[then]]

removing oxygen, sulfur, or borane from the ~~resultant~~ phosphorus heterocyclic dimer represented by formula (4) to obtain an optically active phosphorus heterocyclic dimer represented by formula (5):

~~[Chem. 5]~~



(5)

(wherein R ~~and n represent the same as the above~~ represents a linear or a branched alkyl group having 2 to 20 carbon atoms or a cyclic alkyl group having 3 to 20 carbon atoms, n equals 1); and

wherein said step of reacting the primary phosphine represented by formula (1) with the compound represented by formula (2) includes using 1,3-dichloropropane as the compound represented by formula (2).